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ABSTRACT

This paper focuses on the theoretical and practical problems inherent in trying to build, create, develop, enhance, or strengthen networks among persons, groups, or organizations that would be useful in educational change efforts. The concepts of "social networks" and "networking" are defined, and background variables that might influence the potential success of networking efforts are examined. The next section discusses approaches to networking which are evident in the literature, as well as in the case histories of deliberately-created networks developed by Allen Parker and colleagues at the Center on Technology and Society. Tables are used to organize these observations by providing a taxonomy of networking "functions." The analysis concludes with a set of issues, buzzles, and unanswered questions about networking, and draws some general suggestions and implications for those in federal, state, or local settings who would like to understand networking for educational improvement more clearly and to practice it more successfully. (Author/JD)

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ON NETWORKING

by

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Revised Version

ON "NETWORKING"

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The language of educational reform in America has developed and shifted almost mercurially in the last twenty years. In rapid succession since Sputnik, we have heard of "national curriculum projects," "educational innovation," "self-renewal," "educational technology," "organization development," "community control," "knowledge utilization," "capacity-building," "dissemination" "R & D products," "mutual adaptation," "linkage." And now "networking." People from funding agencies, state departments, universities, and school districts alike seem to believe that building and using "networks" can support educational improvement at least as well as--or maybe better than--the structures and processes behind the preceding list of reform labels.

The papers in this book represent a wide range of intellectual and practical approaches to networks and their potential use in educational change efforts. This essay reflects on some prior and underlying questions: is it possible to create social networks that will in fact support social improvement? And if yes, how might one go about it? That is, the focus is on the theoretical and practical problems inherent in trying to build, create, develop, enhance or strengthen networks. The simplest label for such efforts is "networking": graceless though it may be, the term is both direct and appropriately loose for our purposes.

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After some preliminary definitions and clarification of the idea (and indeed the practical possibility) of "networking," the essay proceeds to examine the background variables which might influence the potential success of networking efforts. The next section discusses approaches to networking which are evident in a number of the papers in the current collection, as well as in the case histories of deliberately-created networks developed by Allen Parker and colleagues at the Center on Technology and Society,[1] and the case history by Sarason et al (1977). A crude taxonomy of networking "functions" serves to organize these observations. The essay concludes with a set of issues, puzzles and unanswered questions about networking, and draws some general suggestions and implications for those--in Federal, state or local settings--who would like to understand networking for educational improvement more clearly, and to practice it more successfully. It must be said firmly at the outset that there is much information about networking around, but much of it is complex and confusing, with implications for practice unclear. So the paper is essentially taxonomic rather than prescriptive.

I. The Idea of Networking

Definitions

We need a working definition of "network" itself. At the most abstract, a network is simply a set of nodes or points connected by lines or links. There is often the implication that various things (such as messages, objects, energy, etc) travel along the lines, which thus serve as channels. For purposes of this

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[1] Those referred to during the preparation of this essay included histories of the Laser/Electro-Optics Education Network (1976); Superintendent's Network and Project OPEN (1976); Allied Medical Education Network (1976); Ford Foundation Comprehensive School Improvement Program (1976); Boston West Biology Teachers Network (1976); IGE (Individually Guided Education) (1977); and National Diffusion Network (1977). Parker's comparative analysis across these and other cases (1977) was also helpful.

paper, we are clearly not talking about physical networks (e.g., roads, canals) nor electronic ones (telephone systems, television stations) nor biochemical ones (the brain) but about social networks. In social networks the nodes are persons, groups or organizations. The things which travel between the nodes are socially relevant: as Kadushin[2] points out, they are usually objects, labor, affect, evaluation, knowledge, prescription/opinion, influence and power. So a network is a connected set of social actors exchanging socially-relevant material. For most of our discussion we will naturally be emphasizing educationally-relevant networks.

Networks are often seen as having other properties--as being dispersed, as spanning or crossing other social systems, as being informal and emergent rather than planned, as being peer-oriented rather than hierarchical, as having a "hub" or center, etc. But this paper shares the assumption of Kadushin's that such properties are interesting empirical phenomena, and should not be stipulatively set into a definition. That is, social networks may be formally instituted or informally emergent; they may be trans-organizational or internal to existing organizations; they may be fully-known and visible to their members, or so dispersed that their members do not fully know or understand the network of which they are a part; and they may have no "center," or one center, or more.

The label "networking" will be taken in this paper to refer to deliberate efforts to create or strengthen networks. It has been used in the papers in this volume in many other ways, which should be mentioned here to clarify by contrast the central meaning this paper intends.

At times, "networking" seems used simply to refer to ongoing operation of networks. For example, the Superintendents' Network case by Parker uses

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[2] In the present collection of papers. For simplicity, references to these papers will simply give authors' names, undated.

the word to refer to interaction among network members, and to "systematized, more efficient interactions" among previously unconnected members.

Another meaning of "networking," less visible in the papers, but often heard informally, is that it refers to the operations necessary for a network to produce particular kinds of outputs (e.g., "networking to disseminate innovations," "networking to coordinate services").

Similarly, Parker (1977) lists a series of "networking" mechanisms such as an agreed-upon name, a directory of participants, and curriculum materials. While it is true that such mechanisms may be tactics aimed at expanding or developing a network, they seem essentially to be as much products of an emerging network as they are of a more or less deliberate developmental process.

The Project OPEN case uses "networking" to mean specific tactics carried out to develop a new network (e.g. among school superintendents), such as assembly of interested persons, surveys in a potential problem area, workshops, action training in problem-solving methods, central facilitation by a "link-pin" individual or organization, and so on.

A number of the papers deal more generally with the concept of intervention in networks, either for purposes of utilizing them, or directly building and enhancing them. Sarason et al (1977)[3] do not use the term "networking," but they do describe network-related intervention into social networks on behalf of individuals," citing such strategies as those of Speck and Attneave (1973) where the existing primary social network of kin and friends around a troubled individual is physically assembled to provide therapeutic support. Although the network's bonds may be tightened in the process,

[3] The Sarason et al volume is alluded to from time to time during this essay; though it has been published separately from the papers in the present volume, it was available to their authors in manuscript form and supplied many stimulating and useful ideas.

the primary client is the individual at the network's central node. Projects which have supported natural leaders or helpers in the performance of therapeutic or support functions (Collins and Pancoast, 1976) share this assumption. Sarason et al also discuss the idea of intervention strategies aimed at community change, emphasizing linking, coordinating and reforming existing networks, but do not detail what the actual interventions might be.

Peterson points out that "networks continuously change; as they change ego changes and society changes...If one wishes to change ego in certain ways, one can possibly induce the desired change through alterations in ego's network. And if one wishes to change society in certain ways, one can 'network,' i.e., engage in the structuring of new patterns of interaction." This is perhaps the most general of the intervention-related definitions found in the papers.

Schon's paper provides a useful classification, which distinguishes among types of "network-related intervention." "Network-sensitive" intervention implies deliberate changes in social systems which "avoid disrupting or constraining" [existing] informal networks." "Network utilization" intervention simply employs existing networks to carry out some task (as in the Speck-Attneave work). Finally "network creation or enhancement," either directly undertaken, or indirectly (and distantly) supported through resource allocation and other policies focusses directly on network-building itself.

To summarize: this essay wishes to exclude certain meanings of "networking" (including the regular operations of networks, their products or outputs, and the changes they are able to achieve in the social systems in which they are embedded) in favor of a central meaning: deliberate efforts to create or strengthen networks.

The distinction between system-building on the one hand, and system operations and system output on the other can easily become blurred. For

example, it has often been pointed out in the field of small group behavior that any particular "operation" (for example, a task-oriented behavior such as clarifying the group's goal) usually also "strengthens" (or weakens) the group as a social system. The same point probably applies to network operations and network-building. However, the analytical distinction between operating/ using a network and building/ creating a network needs to be maintained--if only to permit us to see that network operations can cause network development.

A somewhat finer distinction can be drawn, considering system resources allocated respectively to the following functions:

1. Routine operations (carrying out tasks)
2. Repair or system maintenance
3. Specific changes (innovation in the system)
4. Development (innovation of the system, self-renewal, system-building, etc.)

In the terms of the present discussion, "networking" refers to primarily to function 4, and perhaps secondarily to function 3. The issue is essentially one of creating capability where none existed, or enhancing existing capability.

Is Networking Possible?

We should dispose of this question early in this inquiry, else the rest is pointless. A few of the papers in this collection express skepticism or at least caution. Lortie, for example, considers that networking ("fostering of new linkages /by government/ to achieve particular educational goals") is very difficult to do, since networks are spontaneous phenomena, and intervention techniques are "undeveloped and therefore marked by high uncertainty." Kadushin points out difficulties: making low-visible informal networks more visible, effective and formal may destroy their flexibility and innovativeness,

not to mention their vulnerability to pressures from the establishment. Peterson warns that government intervention through networking can hardly be expected to accomplish more than incremental social change, and cites the marginal gains from community action programs (in terms of changes in power relations or institutional structures) as a case in point. Schon's paper also points out that network-enhancement efforts carried out by government may serve to formalize, stress, and disrupt existing networks, eliminate some of their members, and in effect be self-defeating. Sarason et al (1977) stress the essential unpredictability of network development processes, and both Sarason and Allen, at the Washington seminar of paper authors, emphasized that deliberate networking efforts might be inherently self-destructive, or could only be mounted in a probabilistic way.

Yet, as with the aerodynamically unfeasible bumblebee who does in fact routinely fly, networking does seem to be possible. The practical experiences reported by Dalin and Goodlad in their papers, and the many case histories assembled by Parker (though they by no means fully explain the processes involved) suggest rather clearly that networks can be deliberately enhanced, even created. So practitioners of networking exist, and it is in principle possible to explicate what they do, and why it works. A clear understanding of these matters seems to be a good way ahead at present, but it is certainly not inaccessible. And one cannot resist pointing out that all of the authors who expressed skepticism and reservation did in fact include suggestions for networking strategies in later portions of their papers. Thus: networking is possible, even if it may be difficult on theoretical grounds.

General Goals of Networking

We should not leave this preliminary section of the essay without considering what sort of networking efforts, at a very general level, we

should be considering. Presumably, the focus should be on efforts to enhance/create networks which:

1. Bring about educational improvement (as contrasted with those which deliver health services, provide therapy for troubled persons, govern cities, or oppose the government's involvement in a war);

2. Are durable, "reasonably" self-sustaining (will not require continued governmental subsidy for survival and effectiveness); and

3. Will add to knowledge and lore about networking (are studyable during the process, are exemplars, can serve as research and/or demonstration sites).

That is, though some advantage may accrue from thinking about how to build non-educational networks, or examining the building operations behind non-surviving networks, or relatively invisible or inaccessible ones, the prime emphasis ought to be on studyable networking efforts which lead to reasonably stablized networks aimed at educational improvement.

II. Networking: Possible Influences on Strategic Choice

What does how you decide to do networking depend on? In thinking about choosing any particular networking strategy (and its associated tactics), there are presumably some prior considerations: variables to keep in mind as alternative networking approaches are weighed.

It must be said immediately that the papers provide relatively little in the way of firm advice; even the case descriptions are often light on information that would help another networker decide which way to proceed. A "scientistic" statement for this section would be on the order of: "given high loadings on background variables A, B, ...N, one ought to choose a networking strategy of type X." But networking in any particular situation is so full of practical and political issues, so dense with unanticipated consequences, so beset with the incalculable, that such prescriptions are not now

possible--and may never be. Nevertheless, we should try to understand in a general and abstract way something of how strategic choice might conceivably be affected by certain background variables.

A preliminary listing of such variables is: (1) the general "frame" within which the problem of educational change is being viewed; (2) the implicit view being held of the American educational system; (3) the type of educational change contemplated, including its scale; (4) the general type of network being considered; (5) the anticipated network participants, and their locations at the time networking begins. A brief discussion of each follows.

The General Frame

As Schon suggested at the Washington meeting (and Cohen emphasizes as well), the general "frame" within which one views "the problem" for which networks are a proposed solution is an extremely basic background variable. The frame serves, in effect, as a kind of grand strategic backdrop: it dictates the implicit functions of a network, the types of flow it will end up carrying and thus the incentives for participants, and the types of change that can be anticipated if networking is successful in creating or catalyzing a functioning network. Table 1 summarizes these relationships.

To review them briefly: if someone contemplating "networking" considers that the basic problem of educational improvement is that practitioners do not know: (they are "backward," and/or out of date), such a view implicitly limits possible network functions to the central one of modernizing its members. Network flows will be mostly those of knowledge, objects (specific educational materials) and evaluation (what works well and why). The basic change the network will hopefully induce is that of increased diffusion of new technology (including its implementation). Technically better practice

TABLE 1

PROBLEM-DIAGNOSTIC FRAMES AND THEIR CONSEQUENCES FOR NETWORKS

Frame	Network Functions	Primary Flow Types	Anticipated Change
Backwardness/obsolescence	Modernization	Knowledge Objects Evaluation	Diffusion of new technology
Inequity	Justice assurance	Power, influence	Equitable distribution of resources
Stagnation	Revitalization	Affect	Energy increase
Isolation, resource poverty	Cosmopolitanization	Knowledge Labor	Resource increase
Anomie	Creation/ restoration of community	Affect Evaluation	Shared value, meaning, support
Unshared craft	Diffusion of competence	Knowledge Evaluation	Refinement and extension of craft knowledge

is the issue.[4]

An alternative view, much less frequently visible in the world of educational research and development, is that the "problem" is essentially one of inequity: money, good teachers, materials, good schooling itself are unfairly distributed, so that some subsets of consumers and clients (poor, minority, urban, handicapped) receive far less than others. Here a network is seen as functioning to redress the balance, bring justice. And the dominant coin of exhange in the network is that of power and influence.

Still another frame, that of stagnation, may at first glance seem similar to the backwardness/obsolesence frame. But here the implicit view is essentially that will and energy are lacking--that "know-how" is not so much the issue, but revitalization. The flow of affect in a network developed with this frame in mind serves to energize its participants: they realize that they can, so to speak, and proceed to do more of what they already know how to do.

A fourth view of the meta-problem involved in educational change efforts sees it as essentially one of isolation and resource poverty. Some strategies for improvement of rural education have this view. So, in fact, do some involving teacher centers. The idea is that educational practitioners are not only locals, but as a result of their isolation from the big world do not have enough resources to cope effectively. Networks built following this view would be designed to help members at their nodes import more resources (special knowledge, and labor through bartering and exchange).

One can also view the basic problem as one of anomie: educational

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[4] In some cases, a "modernization" frame also involves its "backward" target systems in the learning of (and commitment to) new educational goals as well as means; thus value issues are as much at stake as they clearly are in the other frames.

practitioners are fragmented, lonely, have little sense of shared value, exert little normative influence on each other. In short, they do not form any sort of a community, and a network should thus, via flows of affect and evaluation, develop one: an extended social system where participants share with salient others a sense of what is good, right, appropriate, meaningful, worthwhile - and feel supported by salient others in their efforts to move practice in those particular directions.

A final frame, a blend perhaps of the isolation and anomie views, holds that the problem consists of inadequate means for sharing and deepening the craft knowledge that talented educational practitioners already possess. That is, as Cohen (1977) has suggested, teaching (and perhaps educational administration) are essentially holistic, skilled performances resting on accumulated experience and requiring the exercise of critical judgment--rather than being derivable from analytically-decomposed segments of theoretically-defined schemata. "Craft" in this sense can only be developed through peer sharing, and through apprenticeship, direct, hands-on contact between more and less-skilled craftsmen. Networks designed to refine and extend craft knowledge would assume that skilled performers existed: such networks would transmit knowledge (but intuitive ("figural, in Schon's terms) knowledge rather than "technology") and evaluation, in the service of doing better what cannot be precisely analyzed or codified.

Networks, like life, are not firmly and reliably categorizable into a single one of these frames; most real-world networks have multiple functions and induce many different types of change simultaneously. But frames frame. If a networker (that is, someone building or creating a network) is thinking essentially in backwardness/obsolescence terms, the tendency will be to focus on technology transfer, and to selectively inattend to the need for, say,

energy release or support as desired network outcomes. Thus networking strategies and tactics will in turn tend to be limited. For example, a backwardness/obsolescence view tends to dictate strategies of networking directed toward practitioners on the one hand, and technology developers on the other, with specific tactics such as materials circulation, demonstrations, newsletters, etc. being predominant.[5] A networker with such a view would tend to miss the possibilities that networking efforts (1) might involve parents or students (the inequity frame), or (2) might involve careful attention to development of energizing, anti-stagnation learning experiences at network nodes (as in the case of teacher centers), or (3) might involve (as the anomie frame might suggest) repeated use of short-term shared work projects across network nodes so as to build common values and meanings. These are speculations, of course, but networkers who are aware of their frames, and can go outside them rather than being limited by them willy-nilly, will probably consider a wider range of strategic options.

Implicit Views of the American Educational System

How one goes about educational networking in America will depend on how one views the macrosystem of American education, and the organizations called schools which are embedded in it. That is, after all, the basic context: it contains the raw materials and the energy for networks, has certain leverage points, characteristic dilemmas, and so on. Views of the system are certainly not univocal, and it is important that networkers

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[5] It appears that many, though not all, of the case descriptions by Parker are of networks whose developers had backwardness/obsolesence assumptions; see especially the Laser/Electro-Optics Network, National Diffusion Network, Allied Medical Education, Boston West Biology Teachers, and to some extent Individually Guided Education. Networks such as Project OPEN, the Ford Comprehensive School Improvement Program, and Goodlad's League of Cooperating Schools seemed to be built more around a combination of the craft, stagnation and resource poverty frames. Sarason et al's (1977) account of the Essex network clearly focuses on resource poverty.

consider alternate ones.

A few of the present papers (notably those by Lortie, Goodlad and Kadushin) discuss these matters explicitly; these remarks are largely drawn, however, from a session at the Washington seminar, and from some earlier published material (Bidwell, 1965; Miles, 1964, 1967; Sieber, 1968; Wayland, 1964).

Several aspects of a potential networker's view of the educational macrosystem (and its microsystems) seem likely to affect his or her strategic choices. Each will be reviewed.

Macrosystem aspects. Looking at the system in the large, we can discern (at least) the following issues.

1. Key units. Is primary attention (in one's macrosystem view) paid to schools (as Goodlad suggests), since they are the basic system where service delivery takes place? To districts (as Lortie suggests) since they have substantial power to stop educational improvement efforts arising from elsewhere in the system? To regional entities such as intermediate service agencies, whose extent and influence are growing rapidly? To state departments of education, more and more of which are exploiting their funding and regulatory powers in the service of educational improvement? To universities, whose members prepare practitioners, consult, write texts, do research aimed at educational improvement? To educational R&D producers, a non-modest growth industry over the past decade? To educational materials vendors, whose salesmen's dissemination efforts are far more extensive than those receiving formal blessing from federal agencies concerned with education? To trans-state entities such as the dozens of professional associations, and the major accrediting and certifying bodies? To Federal agencies, whose

members have, as Cohen suggests, money and many ideas for educational improvement, but an uneasy sense of impotence to get them into play?

Or to Congress and state legislatures, or to the courts, both settings where basic educational improvement policies, and mandates, are being fashioned more and more frequently? Or to any of the many different combinations of the above?

Laid out this way, the pieces of the macrosystem (and there are many others) may look "obvious," even trite. The fact remains that networkers have many, many choices to make about where the pieces of their projected networks are to come from, and what existing trans-unit networks they might want to strengthen.

2. The character of the relationships among units. One frequently-heard view is that local schools and school districts are tremendously decentralized, and that very little vertical or lateral integration exists, so that great local variation can occur in schooling. Kadushin calls it "a maze of independence." Cohen has also discussed the view that local schools have all the power, in effect, with little inclination to accept Federal (or perhaps even state) initiatives for educational reform.

An alternative view is that the various units are an "organizational ecology," in Schon's terms, or even a sort of giant community-like setting, as per the configurational perspective of Clark and Guba. Less charitably, the macrosystem can simply be seen as a "mess," a disordered interorganizational field where coherent action is not possible.

Still a third view (ex: Wayland, 1964) is that the macrosystem relationships are decentralized and quite definitely constrained--for example, by general cultural expectations, by the national market

for tests and materials, by accreditation and certification requirements, by professional associations and unions, by student and teacher mobility (schools must be standard enough to accept many newcomers each year), and increasingly by state and Federal legislation.

Here too, the networker's working assumptions determine strategic choice: if one is networking to build connections among largely autonomous systems, the steps along the way are quite different than if one believes one is building coherence from interorganizational chaos, or working within the interstices of a system full of low-visible cultural and social constraints.

3. Functions of schooling. At a very general level, networkers' images of why schools exist, what they do for their social system, must probably be taken into account in considering strategic choices. Does schooling exist to aid modernization, mobility, personal development, creativity and the advancement of the general good? Or does it perform, essentially, the function of maintaining social stratification, fitting students into "appropriate" jobs, maintaining social stability (read perpetuating racism, oppression and "mystification")? As Peterson suggested at the Washington seminar, these views are in some sense almost mutually exclusive[6] (even though Kadushin suggests they can be contained as a single paradoxical conflict between the "rational" and "innovative" aspects of schooling); in any event they will deeply condition choice of networking strategies. (For example, strategies built around an inequity frame will be rarely chosen when the networker

[6] E.g., given a social-stratification-maintenance viewpoint; if schools were to do a genuinely strong job of educating all students "up to their potential," the result would be a social disaster. Similarly, the school which leaves many of its students unable to read or write, hence only fit for jobs at the bottom, is functioning perfectly well and needs no improvement effort.

accepts a social-stratification maintenance view of schooling; craft-sharing strategies, which assume that good practitioners are right, might be chosen more frequently.)

Microsystem aspects. What networkers take for granted about local schools and districts, where educational efforts reach consumers and clients, will also affect networking plans.

1. Goals. It is widely claimed that goals in schools are very generally, rhetorically, and diffusely stated (partly, Lortie suggests, because of multiple and conflicting stakeholders), so much so that they may be literally unachieveable. An associated view is that educational goal achievement is extraordinarily hard to measure, because of the diffuseness and/or the long time required for educational effects to be discernible. All this uncertainty means that there is no "bottom line," so to speak, and "improvement" is nearly impossible.

   An alternative view is that a reasonable practical consensus exists on goals for schools (partly through cultural expectations), and/or can be achieved locally; elegantly or precisely stated goals are less important in a community-like or "ecosystem" - like organization (Goodlad) than in factories or hospitals.

2. Technical capability. It is often argued (ex: Sieber, 1968) that the knowledge base available to educational practitioners is weak; that teachers and administrators belong to a semi-profession; and that there is little certainty that any particular educational treatment will lead to a specific outcome. Lortie suggests that schools are thus "hard-to-assess" organizations.

   There are two countering views: (1) that strong and effective educational technology is available in the form of "validated"

products of educational R and D, if only it can be gotten to the attention of local school people, adapted to their special needs, and supportively implemented (the National Diffusion Network's success suggests this view is not altogether unworkable); (2) that, as suggested earlier, educational workers are essentially "craftsmen" who can pass on their lore to each other, learn from each other, etc.--and that the "knowledge base" is actually not weak at all, if it can be more effectively shared.

3. Coordination. Schools and districts can be viewed as essentially bureaucratic in nature, hierarchically structured and severely constraining to their participants. Less harshly, schools--especially those which are departmentalized, or where team teaching, variants of the "multi-unit" structure, or IGE are occurring--can be seen as reasonably coherent, interdependent systems. Change approaches stressing improvement in "local problem-solving" or organization development tend to be built around the view that schools ought to be, and can with some effort be induced to be, reasonably well-knit institutions.

A more recent view is that schools and school districts are full of "slippage," and much "solitude and variation," in Lortie's terms. They are "loosely coupled systems" (Weick, 1976; see Bidwell, 1965) where goals do not connect with means, where accountability is low and autonomy high, where interdependence is minimal, and where the right hand knoweth not what the left hand doeth. (It should be emphasized that "loose coupling" is not necessarily to be deplored: as Weick points out, such systems tend to be more flexible and adaptive, less a prey to environmental threat, less vulnerable to any single person's incompetence, and

more innovative and supportive of autonomy than their tightly-coordinated counterparts.)

The loose-coupling view also applies to lateral relationships across schools, and across districts (Goodlad, Lortie); for practical purposes, except for upper participants (superintendents, notably) there is no coupling at all.

4. Boundary management. The inhabitants of schools feel that the skin of the organization is at times unbearably thin, over-permeable (Miles, 1967; Gold and Miles, 1977) dissatisfied stakeholders can enter and attack very easily. Much energy goes into coping, especially, with citizen and parent criticism.

An alternate view, that from outside, is that school boundaries are tough and well managed. There appear to be very few examples of genuine citizen participation in the management of schooling (Schaffarzick, 1975), and the few success stories available (Davies, 1976) have enough hortatory flavor to make it clear that deviant cases are being discussed.

Here too these alternate views have networking implications, particularly if an inequity frame for the educational meta-problem is being utilized, and questions of citizen pressure for school improvement became central.

Generally speaking, we might speculate that taking the less-conventional view of micro-system functioning in at least the first three of these areas will lead networkers toward more active creation and enhancement of networks for educational improvement. If goals are seen practically (e.g., everyone favors basic skills improvement); if both technology and craft are seen as available; and if loose coupling is embraced rather than fought off, we might expect more vigorous networking efforts. The view that system boundaries are over-tough

is not "unconventional," but it too seems likely to encourage networking efforts between school and community.

Type of Educational Change

Networkers' strategic choices will also typically be influenced by the class of educational change/improvement they are expecting the network in question to carry, support, encourage, etc. Many alternative classification schemes exist, and it is probably fruitless to do more than describe a few, and leave the reader with some suggestions as to how these too will affect the choice of networking strategies.

Dalin, for example, distinguishes among technical change (ex: particular textbooks), behavioral change (ex: the teacher's style in an "informal education" setting); organizational change (ex: the multi-unit school); and social change (the advent of the comprehensive school).

Miles (1964) suggests that innovations might be classified according to the aspects of the school as a social system with which they are most closely associated, and lists boundary maintenance operations, size and territoriality, physical facilities, time use, goals, procedures, role definitions, normative beliefs and sentiments, structure, socialization methods and linkage with other systems.

Runkel et al (1975) distinguish among change at the level of, in effect, specific innovations which disturbthe system little (such as a new reading series), role change, and organizational/structural changes. This distinction is allied to the frequently-encountered idea that second-order changes ("problem-solving capacity," "self-renewal") which will enable many specific changes are more important or worthwhile than adoption of specific innovations (change in, but not of, the system).

Havelock and Havelock (1973), in a large-scale empirical study, classified educational innovations under the headings of administrative (ex: finance

allocation, decentralization); curricular/instructional (ex: courses and materials, learning centers); individualized instruction and team teaching (essentially a role change); organizational (ex: modular scheduling, schools within a school); and programmatic (ex: bilingual education, learning disability).

There are perhaps two general implications for networkers in these various classifications of change types. The first is that most of the classifications have a strong flavor of the "backwardness/obsolescence" frame, and assume technology transfer as the primary type of change contemplated. The other types of anticipated change presented earlier in Table 1 may alter networking strategies more than will a focus on any particular sub-category in the lists above.

Secondly, the question of the scale of change anticipated is probably implicit in many of these schemes--whether scale is defined as comprehensiveness, scope, degree of impact on the local school as a target institution, or as extensiveness (building-focused, district-wide, regional or nationally-focused changes).

It seems plausible to guess that changes which have less local scale (ex: updating biology instruction) will require networking only of single specialized practitioners (biology teachers), while those with substantial local scale (ex: Individually Guided Education) will require networking of clusters of people from local schools, use of specialized trainers or catalysts to aid local development, etc.

Type of Network Anticipated

Clearly, a network is not a network is not a network: the general label covers a very great diversity.[7] Just what kind of network one has in

[7] In spite of some of the paper authors' assumptions otherwise (for example, Peterson's suggestion that all networks are essentially the same as groups, Lortie's that they are essentially like associations, or Rosenbaum's that they are like community organizations or political coalitions.)

mind will naturally condition one's efforts to create or strengthen it.

Among the current paper authors, Dalin, Schon and Kadushin have looked at types of networks. Dalin suggests single vs. multiple-purpose, content vs. process orientation, and single-role vs. multiple-role participants. However, he does not lay out the typology or suggest examples for particular cells, so it is difficult to assess the importance or utility of his proposed dimensions.[8]

Schon discusses three broad categories of networks, limiting himself to informal ones: helping networks, aimed at providing support or assistance; organizational ecologies, which include both persons and organizations defined by a function (such as health care) or a geographical area (community); and secondary networks composed of "providers, practitioners, interveners and researchers" in some social policy domain (he mentions movement networks, invisible colleges, practitioner networks and program networks). Though Schon calls his list a "typology," it is not one: no underlying dimensions are lifted out for attention. some of the relevant ones appear to be: primary (client)vs. secondary level of participant; inclusion of larger systems vs. individuals only; perhaps local vs. dispersed location; and perhaps ideological/cultural vs. technical/programmatic orientation. A careful substruction of his list would be very useful.

Finally, Kadushin aims at a comprehensive typology, and selects the basic dimensions of instituted vs. emergent (essentially, the degree of formalization); interstitial vs. internal (whether the network links or connects existing systems (or subsystems), or is found totally within one system); and high vs. low visibility (whether the network is fully known to persons inside or outside it.) Whether these are the "best" dimensions (as

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[8] Dalin also makes a thoughtful speculative attempt at suggesting how different types of innovations may emphasize different network flows, and different types of networks. The ideas are plausible, but the reservation expressed above holds for these schemata as well.

in any typology) is uncertain, but we can see from the examples Kadushin supplies for each type that the dimensions (and thus the types) are not only non-trivial but fruitful, even though they ignore the question of the type of change the network is designed to promote (Table 1).

Two issues need attention. First, is Kadushin accurate in suggesting that networks for educational innovation, since they supposedly deal with "non-standard, changing products" and depend on "external economies" should most productively be interstitial, emergent, and of low visibility? Some of his later discussion suggests that it depends on whether one is networking primarily to induce support for high creativity and local inventiveness, or for thoughtful critique and evaluation of widely circulated innovations. If the latter is the case, more-visible networks, with a moderate degree of formalization, may well be more useful--and the experience with the National Diffusion Network provides some empirical support for this view.

In addition, the supposed anti-innovativeness of more-instituted, more-visible networks (since, he suggests, they tend to become more multiple, more careerist, and more commitment-arousing) may not necessarily be a disadvantage for movement-like networks. In Kadushin's example of the open classroom partisan who gets more entrenched and less "innovative," that very entrenchment serves to stabilize "open classroom" ideas (that is, the ideas are not constantly being re-evaluated and revised, but advocated, a strategy that may well be appropriate for innovations which are well validated but minimally diffused). One can conclude that high visibility, in particular, may not be an undesirable feature of networks for educational change, though informality and interstitiality, given the "loose coupling" diagnosis of educational systems (both macro and micro), are probably important.

The second issue, or set of issues, centers on how networking strategies might be different for different cells of the Kadushin typology. While

specific tactics might vary, it seems clear that the three basic dimensions do set useful boundaries on strategic choice (ex: whether to start with a constitution or let one emerge; whether to provide much or little publicity at various stages of development; whether to be wholly interstitial/marginal to existing organizations or to reach into them part way, etc.)

Network Participants

Here we only need to comment on the obvious: that networking strategies will depend in part on the classes of persons (roles) wanted in the network; on the particular persons to be involved[9], on their locations in or between organizations at the time networking efforts begin; on whether they are part of an existing network which is to be beefed up, or are to be assembled de novo; on what their power positions are in the field comprising the relevant organizations (note Peterson's comments on the importance of this). Dalin suggests a useful categorization of potential network members: those who will benefit from the changes mediated by the network, those who will decide about the changes, and those who themselves will have to change during implementation.

To sum up briefly: one's thinking about what sort of networking strategy to choose depends on a number of background characteristics. Perhaps most centrally, one's problem-diagnostic frame, or view of what is wrong and what is needed for educational improvement will condition strategic choice. One's general assumptions about properties of the educational system, both in the large and up close, will have almost as much effect. Finally, the types of

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[9] Though organizations can clearly be members of networks (as in Schon's ideas about "organizational ecologies," and in the case example of the Allied Medical Network), persons always serve as their agents, representatives, etc.

educational change contemplated, and naturally the type of network and the participants contemplated for it will also make a difference in how one chooses to proceed with networking efforts. In most cases it is far from clear precisely what difference these background characteristics make. But it is quite probable that networkers who surface and explicate their assumptions will have more options to consider, and may thus be more effective.

III. Approaches to Networking

The available papers contain some descriptions of actual networking operations, plus some theoretically-based prescriptions and some intutitive suggestions. This section discusses these, placing them in a rough organizing scheme, then reviews some of the rather general options open to an agency (external to any particular present or anticipated network) which would like to encourage or support the creation or growth of networks.

Macro-Strategies for Networking

At the most general level, there appear to be only a few choices for networkers.[10]

1. De novo creation. A new network can be assembled where none existed before.
2. Enhancement. An existing network can be caused to become more effective, capable, or productive, better interconnected, etc.
3. Expansion/extension. An existing network can be enlarged, or two or more existing networks can be interconnected.
4. Differentiation. An existing network can be helped to generate sub-networks or spinoffs.

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[10] Schon also speaks of "indirect" network-enhancement efforts, such as those involved in formulating policies for the support of networks, training of network personnel, doing research on networks and networking, and direct funding of networks or their users. These do not seem like additional networking options, but are support strategies which will result in one or more of the four preceding macro-strategies.

At this level of generality, it seems difficult to make useful statements about networking approaches, though various paper authors did express preferences. For example, Peterson suggests that locating existing networks with promise and enhancing them is the best course, believing that creating new interests is much more difficult than following existing ones. Parker speaks of supporting "fledgling" networks. Schon suggests beginning with an existing "defective" network and starting it on an improvement course.

However, we should note that all of Parker's cases examined for this essay involved de novo network creation, usually because they were interstitial, and their creators seemed to feel either that no networks existed to address the problem involved, or that existing networks were not coping.

(For practical purposes, we should note that it does not make too much sense to distinguish sharply between networking in the de novo case and the "existing" case--since before too long, when early start-up has been managed, de novo turns into "existing," and must be enhanced, extended or differentiated.)

A few paper authors mention expansion/extension macro-strategies: Berry, for example, speaks of adding connections between nodes, space-filling, etc.; Schon describes adding "gap-filling services" for network members; and Sarason et al (1977) and Rosenbaum mention network enlargement through linking two or more networks.

The differentiation macro-strategy is mentioned by Parker in his comparative analysis of cases, where he notes that regional subnetworks and spinoffs appeared during the course of development of most of the national networks he studied, since face-to-face interaction tended to prove costly in time and money once the network was enlarged beyond the initial core of highly-committed members. Subnetworks seemed to grow up around self-selected facilitators. Berry comments on the importance of secondary centers and "neighborhood effects" around these.

Cautionary Remarks

Before we launch into our review of networking functions, three caveats should be mentioned. First, there is no presumption being made that networking functions can be (or for effectiveness should be) tightly engineered and managed. Some empirical evidence suggests (a) a certain unpredictability, even serendipity, in network growth and development (Sarason et al, Allen, Parker); and (b) the value of deliberate protection of informal aspects and the delicate support of emerging structures and mechanisms (e.g., Parker's account of the National Diffusion Network). Both Peterson and Kadushin stress the importance of avoiding bureaucratization, though Kadushin believes that some degree of "institutedness" will be useful at local centers of an extended (national) network.

Second, the functions suggested need not necessarily be performed (or even managed) from the center, hub, or focal point of a network, assuming that one exists. Most networks seem to have dedicated pushers in more or less central positions, but some do not. All that is claimed here is that the functions need to be performed somehow; they may emanate from a hub, or be divided among various nodes in a "mesh" form of network.

Third, it seems likely that functions like those described are somewhat time-bound, are more or less important at different times during the life of a network. The question of whether the natural life-cycle of networks outlined in Parker's comparative analysis is accurate, reflects the inevitable course of empire, etc., should probably remain open. But time is important.

Fourth, as Schon suggests, effective network enhancement inevitably involves multiple intervention: many different functions need to be performed.

Finally, networkers need to keep in mind Schon's injunction to "do no harm": that it may be more important to keep out of a network's way, to avoid duplicating its efforts, and above all to be mindful of the possibility

that interventions aimed at enhancement may well have a weakening or disabling effect.

Networking Functions

The organizing scheme in Table 2 aims at ordering various approaches to networking which are described, prescribed, or intuitively advocated in the various papers.[11] "Functions" are loosely defined as strategic operations more specific than the macro-level ones just discussed, and more general than particular tactics such as "publish a newsletter," "collect dues," etc.

Such functions may be part of structural approaches, where the emphasis is on network development through particular mechanisms, procedures, durable arrangements which transcend persons, or of educative approaches, where the emphasis is on development through the alteration of attitudes, beliefs, and knowledge of the network members. This "hard-soft" distinction has been noted in other discussion of change strategies (ex: Leavitt, 1965; Chin & Benne, 1969; Miles and Schmuck, 1971). Naturally, any particular networker (and many strategies) will usually employ a mixture of both.

The rows of Table 2 indicate that certain networking functions seem to be primarily related to assuring input. They may be more prominent in early stages. Others occur primarily in connection with actual network operations, from early through later stages. And the last set of functions is associated with network outputs, the continuing results of operations.

Input-related functions. What networking functions seem to be mostly associated with a present or prospective network's intake of resources from its environment?

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[11] Limitations of time and space (and reader interest) prohibit an encyclopedic/obsessive coverage; the effort is only to illustrate each function if possible.

1. Problem diagnosis. Networks ordinarily develop as solutions to one or more problems, defined in general "frame" terms, as well as more specifically. Structural approaches to problem-diagnosing and locating include basing the whole network around a single problem area (as in Lortie's suggestion to assemble one around the problem of implementing PPBS systems in schools); Schon makes a similar suggestion. An alternative suggested by Parker is that of defining "umbrella" goals--problems so general that specific aspects will have salience for many sorts of participants.

   For some sorts of networks, notably those involved with diffusion of teaching innovations in areas of rapidly expanding knowledge, an important networking function is presumably that of collecting data on knowledge advances (as in the case of Parker's) Biology Teachers, Allied Medical Education and Laser networks); these changes in turn define crucial specific problems for the network.

   More-educative approaches to problem diagnosis include Schon's idea of increasing an existing network's awareness that its "performance" (delivery of services in a particular domain, for example) is defective, and the idea of convening people faced with a certain class of crisis (e.g., desegregation problems in Parker's account of the Superintendents' Network) so that the urgency of the problem can be acknowledged and shared.

2. Incentives definition. "Problems" and goals shade into incentives--the reasons for entering and staying in a network, seen as benefits or outputs to members. Structural and educative approaches are not easy to separate, but Sarason et al's idea that networkers should build around multiple goals/incentives, Schon's idea of

TABLE 2

NETWORKING FUNCTIONS

	Structural approaches	Educative approaches
Input-related		
Problem diagnosis	Problem-basing (Lortie, Schon) Define umbrella goal (Parker) Collect data on expanding knowledge base (Parker-Biology, Allied Medical, Laser)	Increase awareness of poor performance (Schon) Acknowledge problem urgency (Parker-Supt's Network)
Incentives definition	Define multiple goals (Sarason) Maintain autonomy from granting agency (Peterson) Relax but do not abandon central control (Schon)	Explain opportunity to invest energy (Dalin) Explain purposive and solidary incentives (Peterson) Emphasize tangible, utilitarian rewards (Rosenbaum) Emphasize psychological, political, professional incentives; value of information and "ammunition" (Dalin) Encourage norms of reciprocity (Parker, Kadushin) Trust local initiative and energy (Schon)
Recruitment	Restrict entry to specific roles (Parker-Supt's) Involve all stakeholders (Parker-Laser) Market segmentation (Berry) Voluntarism (Parker-Biology) Allow facilitator self-selection (Parker-NDN) Use highly-respected core (Parker-Supt's) Assemble the "cast" (Schon-Trist) Select respected, tenacious facilitator with ideas (Sarason)	Educate facilitators in networking skills and rationale (Sarason)
Resource mobilization	Add resources to reduce exchange costs (Peterson) Require member donations (many) Political action (Dalin) Resource exchange (Sarason)	Clarify resource exchange/bart model, reduce problem-deficit thinking (Sarason)

Input-related (cont'd)	Structural approaches	Educative approaches
Design	Build infrastructure (Goodlad, Schon) Advisory committees (Parker-Laser) Governance and coordination structures (Parker-IGE) Turn network into a formal cooperative (Schon) Support existing formal association as aid to informal network (Schon) Reallocate tasks among network and other existing agencies (Schon)	Demonstration sites (Parker-Laser)

Operations-related	Structural approaches	Educative approaches
Linkage	Link persons and groups with similar interests (Peterson) Build weak local, strong cosmo politan ties (Lortie) Build local segments around "stars" (Kadushin) Build multiple weak ties (Peterson, Sarason) Directories (Parker-many) Brokering and referral, switching, matchmaking among members (Goodlad, Schon)	Increase attention to linkage as process (ex: newsletter) (many)
Communication	Information exchange (Parker-all; Dalin) Information system (Dalin) Bibliography (Goodlad) Newsletters (many) Journals (Parker)	Diffusion of information to public (potential network members) (Berry)
Education and training	Meetings for face-to-face contact (Dalin) Seminars, workshops (Dalin, Goodlad) Study groups (Devaney) Meeting of whole network (Sarason, Parker) Catalysts for meetings (Parker-Allied Medical) Personnel exchanges, "internships" (Devaney)	Develop local skills, leadership (Goodlad) Trust-building (Parker-Supt's; Goodlad) Build supportive norms (Goodlad) Cognitive mapping of operations (Goodlad, Parker-Supt's) Cognitive mapping of networking (Sarason et al) Teaching "process" emphasis (Dalin) Peer learning emphasis (Dalin)
Technical assistance	Train trainers (IGE) Provide mediators for conflict (Schon; Parker-Allied Medical)	Advice/consultation to key people (Sarason et al) Consultation to network members, both person and organizations (Schon) Exchange of strategic information (Gittell) Circuit-riding (Parker-Ford) Avoid technical assistance from center (Devaney)

Output-related	Structural approaches	Educative approaches
Projects	Special events (Parker-Supt's) Research and development projects (Parker-Ford) Political action, advocacy (Schon)	Training events for "clients" (Parker-NTL)
Materials	Catalogue of network products and activities (Parker-Ford) Handbooks (Parker) Collection/distribution of materials from inside and outside network (Devaney)	Materials as support for network operations (Parker-Laser) Case studies of activities at nodes (Parker) Films (Goodlad)
Evaluation and re-planning	Surveys for needs/resources identification (Parker-Laser, Goodlad) Meetings between meetings (Sarason)	Network self-study and evaluation (Dalin) Self-critiquing by networkers (Schon) Research by "hub" (Goodlad)

"relaxing but not abandoning central control," and Peterson's suggestion that maintaining clear network autonomy from the granting agency will keep incentives crisp seem more structurally oriented than do approaches aimed at clarifying (or perhaps bending) incentives--such as Dalin's idea that network members should know that entering the network provides an opportunity to invest energy (not just receive things passively). Less persuasively oriented, perhaps, are Peterson's advice to emphasize purposive (utilitarian) and solidary (social-support) incentives rather than material ones, and Rosenbaum's suggestion to emphasize "tangible" rewards, by which he means self-interest gains, then friendship. He suggests that goal - or problem - oriented incentives are perhaps less powerful, since salience of the shared purpose can be variable among participants. Dalin believes that psychological, political, and professional incentives all need emphasis, mentions the incentive value of information itself, and comments on network membership as, in effect, supplying members with ammunition for use in their battles with their home organizations ("strong arguments")--but acknowledges that the network, in effect, also provides a vacation from organizational pressures. Schon believes that network-builders must learn to trust and value existing incentives-local motivation, energy, initiative--rather than suppressing them as "illegal," "incompetent," etc.

There are some useful warnings in the papers: Dalin points out that providing or stimulating strong incentives tends to cause closing of the network rather than expansion. Parker suggests that a narrow "quid pro quo" orientation is more typical of fringe participants, and both he and Kadushin point out the importance of

norms of reciprocity (giving without immediate assurance of getting, but with confidence in long-term getting).

3. Recruitment. What can networkers do to locate and attract members? The illustrations in the papers are diverse, depending in part on network purposes. Under structural approaches, we see, for example, Parker citing involvement of all classes of important stakeholders in the Laser network, while Berry comments on the importance of "market segmentation" -- locating only those participants with most interest. Parker describes recruitment patterns restricted to specific roles (superintendents), biology teachers.

The principle of voluntarism/self-selection was seen as important, both for participants (Parker, in the Biology Teachers' network) and for emerging facilitators (Parker, National Diffusion Network).

At the same time, the quality of prospective additions to a network seems to be important in several illustrations. It is felt to be important to start with a highly-respected core group (Parker--Superintendents' Network), and Schon quotes Trist's painstaking process of "assembling the cast" of stakeholders as being most crucial to solving the problems in the network's domain. Finally, Sarason et al stress the importance of careful recruiting of central facilitators (they must be not only respected, but highly tenacious, persevering types with plenty of ideas about the network's domain and networking itself).

On the educative side, however, Sarason et al do feel (and supply a case example to support the claim) that facilitators can in part be taught the skills and rationale of networking, using internships and direct experience.

4. Resource mobilization. Creating networks, or enhancing them, requires dollars, time, energy: nothing can be created from nothing. A usual solution is to add resources directly, (that is, subsidize network start-up) to reduce the extra costs of exchange among members, as Peterson suggests. Many networks require member donations as they become more institutionalized (Parker). As networks get stronger; they also may gain political leverage, and can lobby for resource support (for example, it is not infrequent to see network newsletters urging their members' attendance at legislative hearings, or key members engaging in more or less discreet varieties of lobbying). Dalin mentions political action, but does not tie it specifically to resource mobilization.

   One of Sarason et al's central themes is that considering resources as being only externally derived is fatal to networking; the clear implication is that networkers must continually help network members be aware of opportunities for resource exchange among themselves, bartering services rather than requiring add-on dollar support.

5. Design. Networkers need to give thought to the question of the sort of structure their emerging network will have, and to set such structures in place explicitly, or discreetly allow them to emerge (the term Goodlad uses is "massaging"). Both Goodlad and Schon emphasize the importance of developing an "infrastructure" for the network, by which they seem to mean provisions for communication, technical assistance, brokerage, materials production and distribution, and the like. Other structurally-oriented examples of the results of the design function include the extensive and hierarchically-organized arrangement of councils, coordinators,

committees, and state sub-networks set up for the Wisconsin R&D Center's version of Individually Guided Education (Parker), and the national, regional and local advisory committees for the Laser network (Parker). Schon also describes the process of turning loosely-organized helping networks into a formal cooperative, as well as suggesting support of existing formal organizations (associations) which will in turn aid a network; this may involve the reallocation of tasks and functions among the network and existing agencies.

It should not be assumed that all exercise of the design function leads to planful formalization. In both Parker's account of the development of the National Diffusion Network, and Devaney's description of the Teachers' Centers Exchange

it is apparent that networkers gently encouraged the emergence of working structure, without pre-judging the actual form it would take, or where initiative would come from. Both these networks have stayed relatively loose in comparison with those in the cases described above.

Educatively-oriented examples of the design function are harder to see in the cases, but the building-in of demonstration sites (Parker, Laser network) is one. Visits to the sites serve not only to expand network members' understanding of the innovations they are trying out, but strengthen links, increase communication, etc.

Operations-related functions. Four additional networking functions appear in the cases and papers primarily as ongoing features of network operations; as before, we note that building a network and doing things with the network, though analytically separable, are often simultaneous/concurrent processes.

1. Linkage. Some ideas in the papers are quite general. For example, Peterson suggests that a basic networking function is simply that of linking persons and groups with similar interests. (As Kadushin and Allen pointed out at the Washington seminar, the question of whether to proceed with a homophilous approach (connecting the like-minded) or a heterophilous one (linking diverse participants) depends in part on whether one is seeking to increase rates of technology transfer, encourage cosmopolitanism, etc., or to build more of an advocacy-oriented, social movement-like network. Goodlad also emphasizes the importance of heterophily in generating the extra energy networks need.)

Other general suggestions include Lortie's (that networkers should seek to build weak local and strong cosmopolitan ties); Kadushin's (that the effort should be to build local subnetwork segments around "stars"; and the idea that multiple weak ties are preferred to fewer strong ones (Peterson, Sarason).[12]

At a more specific level, structural approaches to the linking function include the operation variously labelled "brokering," "switching," and "match-making," (e.g., Goodlad, Schon) where network members with skills, information or other resources are linked with other members needing them. Directories of members (as described in many of Parker's cases) serve the same function to some extent.

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[12] Both papers emphasize the "weakness" of ties as an aid to non-conformity and cosmopolitanism, and tend to obscure the fact that multiplicity of ties is an essential accompaniment, since (as Peterson acknowledges) the issue is whether alternative paths for information diffusion will exist when one is broken.

Here too, "educative" approaches to networking-building through linkage seem rarer. However, the content of some newsletters--which, as Goodlad remarks, are a near-universal feature of networks--does seem aimed at teaching members about the importance of linkage as much as it communicates information about events at various network nodes.[13]

2. Communication. At first, the networking task is essentially the creation of simple mechanisms through which "low-energy access to trusted information" (Miles and Lake, 1975) can occur; without this, the contribution of energy which Dalin and Goodlad speak of as an essential feature of productive networks is unlikely--especially for interstitial, geographically-dispersed networks.

The information-exchange function is defined as a crucial aspect of network development in all of Parker's cases; see also Dalin, who mentions the creation of a "personalized information system" through which network members can circulate brief accounts of their work to others. Other specific structural approaches include the development of bibliographies (Dalin; Goodlad); magazines and journals (Parker); and, as we have seen, newsletters.

Although most communication has an educative component, one approach stressing it more fully seems to be Berry's strategy of diffusing information about network-carried innovations to the general public (among which are to be found potential new network members).

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[13] Note that Goodlad reports that the newsletter for the League of Cooperating Schools did not really promote lateral linkage among schools until it became "owned" and operated by network members, rather than being a project of the network "hub".

3. Education and training. Networkers can employ a variety of approaches aimed at teaching network members something, altering their attitudes, knowledge, beliefs, or skills. Structurally speaking, we can place here such approaches as the recurrent sub-meetings for face-to-face contact stressed by Dalin, and in many of Parker's cases; training seminars and workshops (Dalin, Goodlad); study groups (Devaney); the convening of the entire network (Sarason et al, Parker); provision of catalysts facilitators for meetings management (Parker--Allied Medical network); and personnel exchanges and scholarships with an educative intent (Parker-Allied Medical).[14]

These various structures can serve to carry a range of educational messages, from the narrowly technical to the normative and ideological. Goodlad underlines the importance of developing local leadership skills ("local" meaning persons at network nodes--schools in his case--rather than at the hub); both he and Parker (Superintendents' Network) stress the importance of trust-building among network members in early stages. More generally, Goodlad believes that developing supportive norms in the emerging network is of great importance. Norms favoring openness, personal growth,

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[14] We should note in passing that meetings and increased personal contact are extremely important for morale and satisfaction, as well as for learning as such. Bradburn (1969), in his classic study of psychological well-being, found that both sociability and novelty were strong predictors of happiness: people he studied who had made new friends in the past few weeks, or met new people, or gone to a new place, or done something new, were also persons reporting high positive affect. The essence of networking, especially for interstitial networks, is that it increases both sociability and novelty.

mutual respect, professional responsibility, use of external resources, critical analysis of alternatives and the like must be in place to support members' efforts; they not only guide network operations, but tend, Goodlad suggests, to become internalized as attitudes.

Teaching about networks is not only affectively focused: an interesting aspect of several papers is the attention given during networking to the importance of shared cognitive mapping of the network's operations (as in the case of Goodlad's DDAE (dialogue, decision, action, evaluation) model, or Parker's discussion of the importance of Shaw's general systems theory model for the development of the Superintendent's Network). Sarason et al repeatedly emphasize the importance of a shared general model of networking itself (in the account of the Essex network, this involved rejection of general ideas like the "problem-deficit" theory of "services delivery" in favor of a resource mobilization and exchange model.) Dalin, too, suggests that direct, process-oriented learning experiences, supported and stimulated by peers in the network, are crucial: network members tend to join because of the "content" of the network's ideas, but need process-strategic assistance as they carry out their work.

3. Technical assistance. Direct teaching and learning in networks shades over into an associated function: at-the-elbow help as network members are carrying out operation, especially those which are new and not well understood. Structural examples of this include the Individually Guided Education network's development of a cadre of trainers, and the provision of persons serving as conflict mediators (Schon; Parker, Allied Medical case).

The educative approaches noted in the papers include Sarason et al's mention of advice and consultation for key network members or leaders, and Schon's more general suggestion that consultation to both individuals and organizations in a network is a primary network-building means. Gittell, in a memo written before the Washington seminar, emphasized the exchange of strategic information among network members as (in effect) a basic form of peer-operated technical assistance. Parker describes the "circuit-riding" function of network facilitators in the Ford Comprehensive School Improvement case, who worked with whatever problems surfaced at different nodes.

However, the case for technical assistance as a networking function is not monolithic. Devaney and Thorn (1975) believe that technical assistance from the center to a network (such as the Teachers' Center Exchange) is counter-productive compared to the sort of "assistance-giving to neophytes" which takes place naturally and informally among members. They suggest that "abstracting and generalizing--professionalizing the communications of the emerging network would fail: the stations would not broadcast such messages...local purposes, programs and problems /are/ the source of most of the expertise they have to share as well as most of the motivation they feel to learn." The implicit suggestion is that centrally-provided technical assistance will either miss the point or degrade the emerging set of relationships among nodes. It may very well be that the underlying issue is the "frame": technical assistance makes most sense if the issue is backwardness and technology transfer, and least sense if the issue is stagnation/revitalization, or anomie/community-building.

Output-related functions. Networks have products of various sorts. The process of emitting them, and the recirculation of the products through the network may both have enhancing effects.

1. Projects. One such product is the project--a time-limited enterprise of some sort aimed at accomplishing specific goals. Parker (Superintendents' Network) describes the role of special events (usually meetings) as an early networking strategy. Research and development projects are mentioned both by Parker in the Ford Foundation case. Schon describes political action efforts aimed at advocacy and resource assurance.

   Some projects may turn out to be more educative for network members than for the persons or groups they are nominally focused on outside the network. Miles and Schmuck (1971) describe the network-building effects of interaction among trainers during early training projects carried out for the Esso company; some of the trainers were a nucleus of what later became the Organization Development Network; Parker (in his comparative analysis) comments on the functions of human relations training laboratories (nominally carried out for clients) in building and strengthening the NTL network of trainers.

2. Materials. Networks also produce many sorts of materials, ranging from specific documents and forms produced at a particular node during its operations to case studies and comprehensive how-to-do-it guides.

   Structurally-oriented examples of networking through materials include the production and distribution of catalogues of network products and activities (Parker--Ford case; Devaney and Thorn, 1975); working handbooks of operational methods (Parker); and more generally

the routine collection and distribution of all sorts of materials relevant to the network's mission, derived from inside and outside the network.

Some materials-related approaches have a more-strongly educative flavor than others. For example, the materials developed for the Laser network (Parker) were essentially a modularized support system aimed at helping network members carry out their task of revising/updating curricula and teaching methods in the laser/electro-optics area. Case studies of activities carried out at various network nodes (Parker--several) also seem to have this character; they are essentially aimed at being instructive for other network members. The films of network activities described by Goodlad also seem to have this basic intent.

3. Evaluation and replanning. Finally, network-sponsored studies of their own functioning, when fed back into subsequent networking operations, have a strengthening effect. Both Parker (Laser case) and Goodlad mention the idea of surveys to identify network members' needs, and resources for meeting them. Sarason et al describe "meetings between meetings," when the Essex networkers took time to critique what had happened at previous general network sessions and plan next steps.

The educative effects of self-critique by networkers are stressed by Schon, and Dalin believes that network self-study and evaluation is essential for development. Goodlad suggests that the research being carried out by the "hub" staff on the functioning of schools in the League of Cooperating Schools network (a) helped shift the staff's commitment toward supporting schools in helping themselves; (b) did in fact supply data useful in steering local

efforts. It is also clear that the research, when fed back, tended to supply validation for the "DDAE" cognitive map being used to guide network activities.

III Conclusions

Issues and Puzzles

The sorting-out of networking functions detailed above leaves a number of questions unanswered. Long lists of "needed research" studies are always easy to produce, and often do not seem very fruitful. Here we will emphasize only those that seem most salient.

Networking given different frames. How might networking functions differ, if they do, across networks being generated with varying meta-problem definitions? The case material available is richest in technology-transfer examples, and quite thin when it comes to the five other frames in Table 1. Gittell has suggested that retrieval of studies of leadership, decision-making and policy-making in social change movements of the 60's (many viewed, it seems, from the inequity frame) would be useful. But just how one goes about networking for community-building, revitalization, cosmopolitanization and craft development is largely undocumented at present.

Formalizing the informal. This review leaves the essential paradox of networking unsolved: can one "institute" an informal, emerging network, formalize, stabilize it without losing the supposed benefits of the non-formal (initiative, energy, peer support, shared meaning, trust)? Schon is rightly as skeptical of the "Romantic myth of the superiority of informal networks" as he is of the ability of formal systems to deliver on their espoused values. Nevertheless, the flavor of many of the cases is that networks

can do things that formal systems cannot, and that institutionalization of networks often seems to proceed at the cost of diminished energy, commitment and vitality. Schon's ingenious idea of supplying external funding and support to an existing formal organization which will in turn enhance a related network helps to buffer the network from central (i.e., governmental) control--but in a larger sense does not escape the problem: the local association may also overwhelm, coopt, enfeeble (etc.) the network it is supposedly trying to build.

An associated problem centers around the fact that while networks can be "massaged," aided subtly to emerge, probabilistically nudged toward more strength, so to speak, the fact remains that a good deal of unpredictability is inherent in network development. Thus one can never be very sure (a) than any particular networking move will strengthen (or even not damage) the network--even in the short run; (b) that any predictable proportion of the hundred flowers that bloom after "successful" networking efforts will be beautiful, smell nice, etc.; (c) that the "built" network will continue to have viability when environmental conditions change, as they will without doubt.

Networking from the center. While it is clear that "hubs" are often important as loci for networking efforts, it is not at all clear whether strong centers are essential--or more precisely, for which sorts of networks they are more and less important. We also do not know which types of networking functions require hub intervention and which do not.

Size and dispersion. We do not know (but suspect) from the case descriptions and papers that efforts to enlarge and interconnect networks will at some point cause them to reach a size (or a degree of dispersion) that

is self-defeating, so that differentiating and sub-networking strategies become necessary. When is this? (And when does differentiation in turn become unworkable?)

Resource requirements. There is very little clarity at present about how many dollars/person-hours are needed to launch a new network with given sorts of purposes and participants, to enhance or strengthen it or even to maintain it in a reasonably steady state. Though dollar figures (and less frequently time investment figures) are occasionally provided, there is almost nothing in the way of a common metric that would help anyone see whether networking is being cost-effective (in comparison, say, to supplying direct technical assistance to existing organizations).

Energy mobilization. Part of the uncertainty about resource requirements is that they are confounded with the question of the degree to which networking induces contributions of member energy that are more substantial than those typically evoked by formal organizations. If interstitial, informal networks are to succeed in the very ambitious task of increasing not only problem-solving efforts but problem-solving capability in existing organizations, then extra energy is needed. What sorts of networking efforts generate hope, commitment, investment--and what sorts leave network members feeling drained and discouraged?

Timing. Table 2 suggests by its very construction that certain networking functions (such as incentive definition) are more crucial during early stages than later on. But this is probably presumptuous. And even though Parker has suggested a sort of developmental life cycle of networks in his comparative paper, we do not know very well just when certain functions need more attention, or when it is fatal to try to intervene in certain ways--and indeed whether the sequence from isolation through contact and building to

institutionalization and dissipation that Parker proposes would hold up across many types of networks and meta-problem frames.

Allocating Resources to Networking

What courses of action are open to an organization--a Federal agency, a state department, an intermediate unit, a local school district-- that desires to advance the state of the art as far as educational networking is concerned? Table 3 suggests a framework within which alternatives can be viewed and/or generated.

An organization's funds can be spent on a variety of networking functions including direct support of operations, research, training, and dissemination. And such money may go to one's own organization, to other existing organizations or programs which are not networks, to some specially-created organization which is not a network, to an existing network, or to a newly-created network.

Some sample possibilities are listed in various cells; the intent here is only to be stimulative. For example, an organization such as an urban school district might allocate funds to support its own teachers' networking efforts across schools (as in Parker's Biology network), or might supply funds for training directors of teacher centers in network development skills. Or an intermediate educational unit charged by its state department with educational improvement might allocate funds to dissemination of information about networking efforts in the state.

Considering other existing organizations as recipients, a Federal funding agency might choose, for example, to create incentives for local school districts or intermediate service agencies (and perhaps universities) to support networking efforts, and/or pass funds directly through to networkers. Or funds might be supplied to universities or other contractors to study the impact that large-scale educational improvement programs, such as Title I or

TABLE 3

RESOURCE ALLOCATION POSSIBILITIES

Function	Resource recipients: Own organization	Other existing organization	Specially-created organization or program	Existing network	New network
Operational support	Support networking efforts across schools in own LEA	Create incentives for LEA's or ISA's to support networks/pass through resources	Create network-managing organization	Subsidize certain networking functions (e.g., materials development)	Support network creation (e.g., NDN, Teacher Center Exchange)
Research		Study impact of Title I, special education programs, etc. on network development		Grants for self-study	Networking process documentation
Training	Train teacher center directors in own LEA in networking skills		Create network service centers for technical assistance	Networker internships	
Dissemination	Intermediate unit collect and circulate information on networking efforts		Seminars on networking, resulting in book	Grant for case studies	

various special education programs have had on network development (a good example is the National Learning Disabilities Assistance Project).

Or an agency might decide to create new organizations, such as one or more network-managing organizations, at a state, regional, or national level. Or to fill networker training needs, it might also be desirable, say, for a state department to create network service centers, whose mission was to supply technical assistance on general networking matters (as contrasted with network-specific substantive help.) An agency might also choose to heighten general practitioner awareness of networks and networking, by subsidizing a seminar on these topics, leading to a book.

It is also possible for any organization to channel funds directly to existing networks. For example, a state department could choose to subsidize particular networking functions thought to be of special interest (such as materials development or technical assistance). Grants might also be made to existing networks for self-study purposes, or to enable direct training of networkers through internships. Existing networks might be subsidized to describe their own networking experience.

Finally, an agency might choose to provide direct operational support to a new network, enabling its creation (as in the case of the National Diffusion Network or the Teachers' Center Exchange), and/or to buy a careful documentation of network development from the start (note that nearly all extant case studies of networking are retrospective rather than concurrently documented).

The empty cells are meant to invite other inventions; it may well be that other rows and columns should be added as well.

Some General Advice

The preceding sections have outlined some issues and puzzles, and proposed some classes of resource allocation for educational units at various

levels interested in understanding networking better and furthering its practice. Given the state of our current knowledge of networking (modest), it does not seem possible to be highly specific about desirable courses of action. But some general rules of thumb, some practical urgings, seem reasonably justified.

Assumptive clarity. Anyone wanting to understand or support networking efforts should probably make a strong effort to explicate his or her own underlying assumptions. This is perhaps most sharply true in the case of problem-diagnostic "frames", as noted above. But almost as important is clarity about one's view of the educational system at macro and micro levels. Without such explicitness, wasted resources are almost inevitable. The most economical strategies for getting assumptive clarity usually involve the importation of strangers, cosmopolitans not bound by the local conventional wisdom, who can serve as "external critics" (in Sarason's term) and enhancers of awareness before too many resources are irrevocably committed.

Taxonomically-supported planning. The three preceding taxonomies (of frames, of networking functions, and of resource allocation options) can profitably be used to help networkers (or researchers of networking) look before they leap. The usual problem in social action efforts, as well as in research on them, is closing off practical and intellectual options too soon. Checklists have their uses: not least of these is support of the basic question, "What else is possible?"

Process documentation. Networking, this analysis suggests, is a quite uncertainly-understood process at best. We have only a rough set of possibilities in front of us. There are very few explicit and reliable guidelines as to what sort of networking strategies and tactics are most likely to induce good network functioning and viability, given various frames and

views of the educational environment. From a research point of view, we badly need ongoing (not retrospective) documentation of networking efforts and their consequences, as they happen in all their complexity. From an action standpoint, networkers must advisedly be reflexive, collecting data on the results of their efforts and feeding it back to themselves and their "clients", if they are to have any idea at all of what is working and what is not.

High-leverage investment. If the accounts here are to be trusted, networks tend to be happening "anyway", in and across many different parts of the educational system, since they are a social form that meets many needs. This suggests that, generally speaking, agencies with limited funds should not try to create new networks, and should be selective about getting into operational support of networks. Rather, the aim should be to enhance networkers' capabilities through linked training and research efforts, like those suggested in Table 3. Better documentation will naturally generate a better curriculum for networkers, and networkers with new skills will generate additional hypotheses on what works. The development of most "professions" has typically proceeded not from abstract specification of cause-effect relationships, or even through derivation from verified theory----but from the practical exercise and accumulation of craft, gradually systematized and clarified. If we are to have a coherent theoretical understanding of what sorts of networking efforts lead to what outcomes, we must keep examining what networkers actually do and what they think they are doing, and recirculate this into further networking efforts (both in the same system and new ones). An inductive, developmental stance seems by far the most appropriate one at present.

REFERENCES

Bidwell, C.E. The school as a formal organization. In J.G. March (Ed.) Handbook of Organizations. Chicago. Rand McNally, 1965. pp. 972-1022.

Bradburn, N. The Structure of Psychological Well-Being. Chicago: Aldine, 1969.

Chin, R. & Benne, K.D. General strategies for effecting change in human systems. In W.G. Bennis, K.D. Benne and R. Chin (Eds.) The Planning of Change. New York: Holt, Rinehart and Winston, 1969 (2d ed.) Pp. 32-59.

Cohen, D. Ideas and action: social science and craft in educational practice. Unpublished paper, Graduate School of Education, Harvard University, 1977.

Collins, A.H., & Pancoast, D.L. Natural Helping Networks. Washington, D.C.: National Association of Social Workers, 1976.

Davies, D. (Ed.) Schools Where Parents Make A Difference. Boston, Mass: Institute for Responsive Education, 1976.

Devaney, K., and Thorn, L. Exploring Teachers' Centers. San Francisco: Far West Laboratory for Educational Research and Development, 1975.

Gold, B.A., and Miles, M.B. Change and Conflict: A Case Study of an Innovative School. New York: Center for Policy Research, 1977.

Havelock, R.G., & Havelock, M.C. Educational innovation in the United States Vol. I. The national survey: the substance and the process. Ann Arbor: Center for Research on Utilization of Scientific Knowledge, 1973. NIE Contract No. OEG-0-70-4296 (508)

Leavitt, H.J. Applied organizational change in industry: structural, technological and humanistic approaches. In J.G. March (Ed.) Handbook of Organizations. Chicago: Rand McNally, 1965. Pp. 1144-1170.

Miles, M.B. Educational innovation: the nature of the problem. In M.B. Miles (Ed.) Innovation in Education. New York: Teachers College Press, 1964.

Miles, M.B., Some properties of schools as social systems. In G. Watson (Ed.) Change in School Systems. Washington: National Training Laboratories, 1967. Pp. 1-29.

Miles, M.B., & Lake, D.G. Communications networks in the designing and starting of new schools. Paper read to American Educational Research Association meetings, 1975.

Miles, M.B., & Schmuck, R.A. Improving schools through organization development: an overview. In R.A. Schmuck & M.B. Miles (Eds.) Organization Development in Schools. La Jolla: University Associates, 1971. Esp. pp.8-9.

Parker, L.A. Networks for innovation and problem solving and their use for improving education: a comparative overview. Cambridge, Mass.: Center on Technology and Society, 1977.

Runkel, P., Wyant, S., & Bell, W. Organizational Specialists in a School District: Four Years of Innovation. Eugene, Oregon: Center for Educational Policy and Management, 1975.

Sarason, S.B., Carroll, C., Maton, K., Cohen, S., & Lorentz, E. Resources, Community and Exchange Networks. San Francisco: Jossey-Bass, 1977.

Schaffarzick, J. The consideration of curriculum change at the local level. Ph.D. dissertation, Stanford University, 1975.

Sieber, S.D. Organizational influences on innovative roles. In T.L. Eidell & J.M. Kitchel (eds.) Knowledge Production and Utilization in Educational Administration. Eugene, Oregon: CASEA, 1968. Pp. 120-142.

Speck, R.V. & Attneave, C.L. Family Networks. New York: Pantheon, 1973.

Wayland, S. Structural features of American education as basic factors in innovation. In M.B. Miles (ed.) Innovation in Education. New York: Teachers College Press, 1964. Pp. 587-614.

Weick, K. Educational organizations as loosely coupled systems. Administrative Science Quarterly, 21(1); 1-19, 1976.